GKN-0135 PATENT

## What is Claimed:

1. A filter having a graduated structure, comprising at least a first, a second, and a third layer each having a different pore size, wherein:

the filter is manufactured from sinterable materials;

the pore size of the first layer is within a range of approximately 0.01  $\mu m$  to approximately 1  $\mu m$ ;

a thickness of the first layer is within a range of approximately 0.5  $\mu m$  to approximately 50  $\mu m$ ;

the first layer is formed from one of a metal oxide material and a mixture comprising a metal oxide material;

the second layer is formed from a metallic material;

a thickness of the second layer is within a range of approximately 5  $\mu m$  to approximately 300  $\mu m$ ;

the third layer comprises a coarse and porous supporting body formed from a metallic material;

the metal oxide material of the first layer penetrates into the second layer to a depth of approximately one to approximately five pore plies;

the pore size of the first layer is approximately 1/3 to approximately 1/6 of the pore size of the second layer; and

the first layer is formed using a suspension having a viscosity within a range of approximately 0.003 pas to approximately 0.96 pas.

GKN-0135 PATENT

2. The filter of claim 1, wherein the pore size of the first layer is within a range of approximately  $0.05~\mu m$  to approximately  $0.6~\mu m$ .

- 3. The filter of claim 1, wherein the one of a metal oxide material and a mixture comprising a metal oxide material is selected from a group comprising reducible metal oxides and metal oxides that are difficult to reduce.
- 4. The filter of claim 3, wherein the metal oxides that are difficult to reduce are selected from a group comprising TiO2, Al2O3, ZrO2, Cr2O3, CaO, MgO and SiO2.
- 5. The filter of claim 3, wherein the reducible metal oxides are selected from a group comprising AgO, CuO, Cu2O, Fe2O3, Fe3O4 and NiO.
- 6. The filter of claim 1, further comprising a layer formed from mixed oxides and located between the first layer and another layer of the filter.
- 7. A method for producing the filter of claim 1, comprising applying a suspension comprising a metal oxide material onto a previously-formed layer of the filter and subsequently sintering the metal oxide material in the suspension.
- 8. The method of claim 7, wherein the suspension comprising a metal oxide material is sprayed onto the previously-formed layer of the filter.
- 9. The method of claim 7, wherein the previously-formed layer is produced by spraying a suspension comprising sinterable materials and subsequently sintering the sinterable materials in the suspension.
- 10. The method of claim 7, wherein the previously-formed layer is smoothed mechanically before the suspension comprising a metal oxide material is applied.

GKN-0135 PATENT

11. The method of claim 7, wherein the suspension comprising a metal oxide material further comprises at least one of a solvent, a binding agent, a stabilizer, and a dispersing agent.

- 12. The method of claim 11, wherein the solvent is selected from a group comprising water, methanol, ethanol, isopropanol, terpenes, C2-C5-alkenes, toluenes, trichlorethylenes, diethyl ether, C1-C6-aldehydes, and ketones.
- 13. The method of claim 11, wherein the binding agent is selected from a group comprising polyvinyl acetate, waxes, shellac, polyethylene oxides, and polyglycoles.
- 14. The of claim 11, wherein the stabilizer is selected from a group comprising organic acids, inorganic lyes, polyacrylamides, polyacryl acid, and amines.
- 15. The of claim 11, wherein the dispersing agent is selected from a group comprising polyamines, phthalic ester, and polyethylenemines.